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SECTION 275.00 – ITD QUALITY ASSURANCE STANDARD PROCEDURES

275.01 Aggregate.

AASHTO T 176

Plastic Fines in Graded Aggregates and Soils by the Use of the Sand Equivalent Test

1. Technician Qualification Per [AASHTO T 176, Section 8 Operator Qualifications](#).

- 1.1 Technician qualification for sand equivalent testing using the mechanical shaker method is covered by the WAQTC Aggregate module, however, the manual and hand methods are not. Therefore, an individual qualification is required per [AASHTO T 176, Section 8 Operator Qualifications](#) when equipment necessitates sand equivalent testing using either the manual method or hand method.

When the manual or hand method is to be used, the District Independent Assurance inspector will evaluate and qualify the ITD testing technicians performing the testing per [AASHTO T 176, Section 8 Operator Qualification](#). The testing technician is responsible for making arrangements for the evaluation prior to the start of such testing.

Contractors are responsible for qualification of their testing technicians, per [AASHTO T 176, Section 8 Operator Qualification](#), when performing sand equivalent acceptance testing using either the manual method or hand method. The Contractor is responsible for the documentation of the evaluation and qualification of the testing technician by a WAQTC-qualified tester.

A Certificate of Qualification will be used for documenting individual qualification of testers for the manual method or hand method (see following page). The individual qualification will be valid for a period of five years.

2. Labeling of SE Solution

- 2.1 SE solution containers will be labeled with the date the working solution was mixed. In accordance with [AASHTO T 176, Section 2.8](#), working solutions older than 30 days will be discarded.

Idaho Transportation Department

Technician Qualification for AASHTO T 176 (Manual or Hand Method)

Technician Name & Sampler Tester Number (WAQTC)

Has met the qualification requirements to perform AASHTO T 176 Plastic Fines in Graded Aggregates and Soils by the use of the Sand Equivalent Test per section 8 (operator qualifications). Both Manual and or Hand shaking results were compared with the Mechanical shaker method and met the required standards. This qualification is valid for a period of five years beginning with the date the tests were performed.

Date

Manual Method Results

Sample #1:

Sample #2:

Sample#3:

Ave. \pm 4:

Hand Method Results

Mechanical Method Results

Tests Observed by: _____

Printed Name & WAQTC No.

Signature

Date

District Materials Engineer: _____

Signature

Date

Quality Assurance

ITD Quality Assurance Standard Procedures

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275.02 Asphalt.

AASHTO T209

Theoretical Maximum Specific Gravity and Density of Hot-Mix Asphalt Paving Mixtures

1. Procedure Modifications

All laboratory mix samples will be cured two hours plus or minus 5 minutes at the asphalt binder manufactures recommended temperature for compaction.

AASHTO T 308

Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method

1. Procedure Modifications to FOP AASHTO T 308.

- The testing laboratory owner must perform the Ignition Furnace Verification Procedure as outlined in the ITD Laboratory Qualification Program. The lift test will be performed and recorded weekly when the furnace is in use. The balance verification will be performed and recorded every 30 days when the furnace is in use and following furnace transport.
- For samples where the asphalt binder content is determined by an internal balance, this value must be verified by an external balance.
 - Calculate the asphalt binder content with external masses as follows:

$$P_b = \left[\frac{M_i - M_f}{M_i} \right] \times 100 - C_f - M$$

where:

P_b = the corrected asphalt binder content as a percent by mass of the HMA sample

M_f = the final mass of aggregate remaining after ignition

M_i = the initial mass of the HMA sample prior to ignition

C_f = correction factor as a percent by mass of the HMA sample

M = percent moisture content as determined by the FOP for AASHTO T 329.

- If the calculated asphalt binder content is within 0.15% use the corrected asphalt binder content (percent) from the printed ticket. If the difference is greater than 0.15% use the calculated asphalt binder content (percent) and determine and correct the source of the variation prior to reliance on the printed ticket.
2. Agency Approved Method for Combining Aggregates for Producing Calibration Factor Samples:
All samples shall be the same gradation and shall be combined sieve by sieve down to and including the material passing the No. 200 sieve.

WAQTC TM 8

In-Place Density of Bituminous Mixes Using the Nuclear Moisture-Density Gauge

1. Cement Recycled Asphalt Base Stabilization (Crabs)

- 1.1 Test method [WAQTC TM 8](#) backscatter mode is used to determine in-place density with the following modification:

A roller pattern curve must be established with single shot (no rotation required) one-minute counts with the uncorrected nuclear densometer. The required compaction is achieved and final process rolling is defined as when the final roller pass adds no more than 0.5 lb/ft³ (8 kg/m³) to the previous in-place density.

2. Plantmix Pavement

- 2.1 Test method [WAQTC TM 8](#) backscatter mode is used to determine in-place density, expressed as a percentage, rounded to the nearest tenth of one percent.
- 2.2 For plantmix pavement when no acceptance test strip is required, density is determined from the average of a minimum of five (5) random cores with the average of a minimum of three (3) random loose mix samples to determine percent compaction in accordance with [AASHTO T 166 method C \(Rapid Test for Method A\)](#) and [AASHTO T 209](#).

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AASHTO T22

Compressive Strength of Cylindrical Concrete Specimens

Neoprene caps may be used provided the manufacturer provides certification and quality control tests indicating the caps meet the criteria in A12 of AASHTO T22. In addition, verification testing per A12 must be performed at least every 24 months or when new neoprene caps from a new lot number is purchased.

Otherwise, sulfur capping per AASHTO T213 is required.

Reference FOP AASHTO T22 of ITD Sampler Tester Qualification Program for Concrete Laboratory for specifics and an example on verification testing.

Quality Assurance

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275.04 Embankment and Base In-place Density.

AASHTO T 310

In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1. Soil & Aggregate

- 1.1 Test method FOP [AASHTO T 310](#) is used to determine the in-place density. The results are expressed as a percentage, rounded to the nearest whole percent, of the maximum dry density from the density standard.

A compaction test result over 105% is not considered valid. The material and calculations must be evaluated to resolve the cause of this type of test result.

A gradation and a SE must be performed in order to confirm the correct density standard. A wet sieve on $\frac{3}{4}$ ", No. 30, No. 4, and SE is performed and recorded on the [ITD-850](#) at the same frequency as a density test.

For materials identified as too granular to test (per definitions in [Standard Specification Subsection 205.03-F](#)), materials are to be compacted according to the requirements of [Subsection 205.03](#). Documentation is required of the compaction equipment and compaction effort.

1.2 Soils and Soil-Aggregate Mixtures

- 1.2.1 Standard density is the maximum dry density from the [Standard Specification 205.03-F](#). A laboratory moisture-density curve is used (produced) that represents the soil or soil-aggregate mixture. All moisture-density curves must have at least three (3) points at or below optimum moisture and two (2) points greater than optimum moisture.

- 1.2.2 For [AASHTO T 99](#) or [AASHTO T 180](#), a one-point determination per [AASHTO T 272](#) is performed for every compaction test to select the proper moisture-density curve, including correction for coarse aggregate ([AASHTO T 224](#)) when necessary.

- 1.2.3 Requirements for matching a one-point determination to an existing moisture-density curve:

1. The density of the one-point determination must match the moisture-density curve within ± 2 pounds/cubic foot (32 kg/m³).
2. The moisture content of the one-point determination must match the moisture-density curve between 80-100% of optimum moisture of that curve.

Otherwise, an additional moisture-density curve must be developed by the ITD field personnel using form ITD-898, or a family of curves ([AASHTO T 272](#)) may be used if the curves were developed with material from the same geologic source area with concurrence from the District Materials Engineer.

- 1.3 Granular Materials and Processed Aggregates Above Subgrade
 - 1.3.1 [Idaho T 74](#) is generally used to determine standard density, but the standard specification for aggregate base allows the use of [AASHTO T 180](#).
 - 1.3.2 For [Idaho T 74](#) curve, the standard density is the maximum dry density corresponding to the percent passing the No. 4 (4.75 mm) sieve. A laboratory density curve is used (produced) that represents the granular material or processed aggregate.
 - 1.3.3 A new [Idaho T 74](#) curve must be provided annually for existing stockpiles or for new stockpiles of processed material.
 - 1.3.4 A field gradation test is not required for each density test if the nuclear density gauge has been calibrated for moisture correction **and** the gauge reading is equal to or greater than 95% (94.6 rounded) at the peak point of the Idaho T 74 curve.
 - 1.3.5 For [AASHTO T 180](#), follow the preceding procedures for moisture-density curves.
- 1.4 Compacting Backfill
 - 1.4.1 Use density standard defined in previous procedures by the type of backfill material.
- 2. Determining Moisture Correction for [AASHTO T 310](#)
 - 2.1 For each soil or material type, the average moisture content of at least seven (7) consecutive tests is calculated to indicate the density gauge is reading the moisture content within a tolerance of 1% moisture content of the actual [AASHTO T 255/265](#) test results. If the average moisture content exceeds the 1% tolerance, a moisture correction is applied. If less than seven density tests are required for a specific material type, then the percent moisture is determined by performing [AASHTO T 255/265](#).